

BELSAR-Science

Exploitation of the first ever bistatic SAR time series for agriculture and hydrology

J. Bouchat, N. Verhoest, X. Neyt, A. Orban, C. Barbier, P. Defourny

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Université catholique de Louvain
Earth and Life Institute



Universiteit Gent
Laboratory of Hydrology and Water Management



Royal Military Academy
Signal and Image Centre



Université de Liège
Centre Spatial de Liège



Building on
BELSAR-Campaign

Building on a unique bistatic data set from BELSAR-Campaign



HESBANIA site (BELAIR)

~ 15 × 4,5 km

5 airborne L-band acquisitions

Mono- and bistatic

Full-polarization: HH, HV, VH, VV

30/05, 20/06, 30/07, 28/08, 10/09

Field measurements

10 winter wheat fields

10 maize fields

Soil variables: moisture and roughness

Crop variables: height, BCCH, GAI, and biomass

Complementary C-band acquisitions

RADARSAT-2

Sentinel-1A/B



Introducing
BELSAR-Science

BELSAR-Science objective

Explore the potential of mono- and bistatic SAR time series for

- > Change detection
- > Hydrology
- > Agriculture

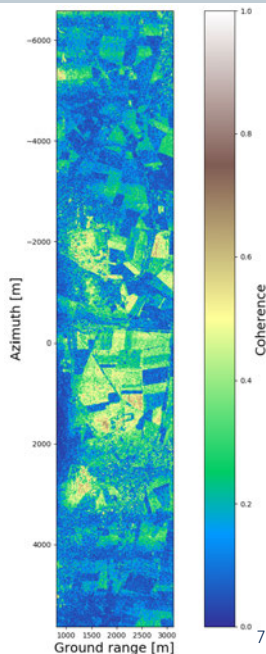
EL SAR bistatic Polarimetric Image
red (VV), blue (HV) and green (HH)

Global & local change detection (RMA & CSL)

- Generation of advanced PolInSAR products
- Analysis of coherence and intensity via classification methods
- Comparison between mono- and bistatic performance

Farming practices detection (UCLouvain)

- Depends on results from previous step
- Best PolInSAR variables for crop development stages & soil preparation practices identification
- Supports crop growth modelling & monitoring



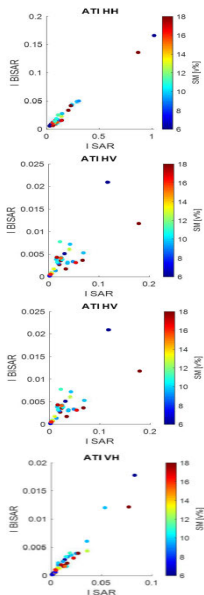
Sensitivity analysis to soil variables (UGent)

- Comparison between SAR time series and in situ measurements
- Further assessment based on scattering models
- Relationship between SAR signal, soil moisture, and soil roughness

Soil moisture retrieval (UGent & UCLouvain)

- Depends on results from previous step
- Development of a soil moisture retrieval algorithm which doesn't require soil roughness

SAR vs BiSAR w.r.t. soil moisture



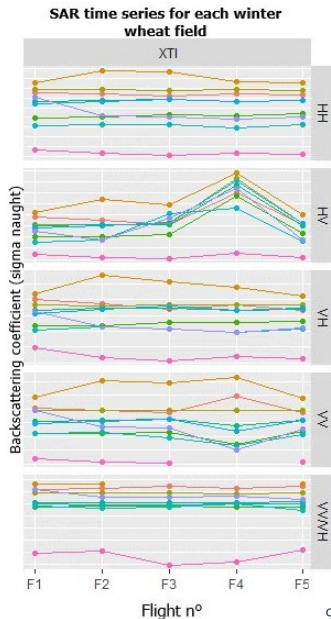
Sensitivity analysis to biophysical variables

(UCLouvain & UGent)

- Comparison between SAR time series and in situ measurements
- Further assessment based on scattering models
- Identification of the best crop variables for crop growth monitoring


Crop biophysical variables retrieval (UCLouvain)

- Depends on results from previous step
- Development of an effective biomass retrieval algorithm





EL SAR bistatic Polarimetric Image
red (VV), blue (HV) and green (HH)

 METASensing product

Thank you for your attention !

